

(19)



(11)

EP 1 754 930 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
07.10.2009 Bulletin 2009/41

(51) Int Cl.:
F21V 3/02 ^(2006.01) **F21V 25/02** ^(2006.01)
F21W 131/402 ^(2006.01)

(21) Application number: **06118918.9**

(22) Date of filing: **15.08.2006**

(54) **Lighting fixture protection**

Schutzkappe für eine Beleuchtungseinrichtung

Couvercle de protection pour luminaire

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **16.08.2005 FI 20050827**

(43) Date of publication of application:
21.02.2007 Bulletin 2007/08

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Description

[0001] The invention relates to a light-permeable protection for a lighting fixture according to claim 1.

[0002] In the prior art, there is known a light source unit from the Japanese patent publication JP-2001307535, in which unit, a light-permeable protective element is fitted in the opening of the reflector element. Said protective element is realized of a netting element. Its purpose is to prevent the glass splinters from a high-pressure lamp, such as a mercury lamp, from scattering out of the light source unit, in case the lamp should, for one reason or another, explode or be otherwise broken into small pieces. The problem here is the net-like structure of the protective element, which probably remarkably reduces the luminosity of the lamp.

[0003] In the prior art there is known, for example among the industrial lamps manufactured by the applicant, particularly among industrial lamps to be attached to the ceiling, a protection realized of light-permeable plate glass attached to a reflector. The purpose of this, however, is to prevent the access of dust into the lamp, and thus to prevent the reflector from getting dirty. When a high-pressure lamp explodes, a sudden increase in pressure inside the lamp easily breaks the plate glass, which results in more glass splinters than in the case of the destruction of an industrial lamp that is not provided with any plate glass in connection with the reflector.

[0004] In the prior art, there is known a detachable light fixture cover system from patent application publication US 2004/0201996, where the light fixture cover comprises a lamp fixture body, peripheral resealable lip and an installation/removal tab. The lamp fixture body has a hemispherical shape and circular outer boundary. The peripheral lip is attached to the circular outer boundary of the body. When the light fixture cover is attached to the lamp fixture, the peripheral resealable lip grips the outer perimeter of the lamp fixture without any other fastening means. The installation/removal tab is attached to the peripheral lip so that manual installation/removal of the lamp fixture over the outer rim of the lamp fixture can be carried out.

[0005] The object of the invention is to eliminate the drawbacks connected to the above described lighting fixtures and particularly to their protective elements. Another object of the invention is to realize a novel protection that is in particular suited to be used as an accessory for already installed lighting fixtures, in order to improve safety for instance in the production facilities of food industry.

[0006] A lighting fixture protection according to the invention is characterized by what is set forth in claim 1. Dependent claims describe preferred embodiments of the invention.

[0007] The above described light fixture cover system teaches a press fit or snap-on attachment for a light fixture cover to a light fixture without screws, clips, clamps and/or other hardware to joint these two components to-

gether. In the first place, the cover is meant to arrange to the upper side of the light fixture as presented in the drawings of the patent application.

[0008] The known light fixture cover system has some problems. This kind of press fit attachment does not offer a reliable and secure joint between the cover and the light fixture, especially when the cover is to be arranged below the light fixture (or to one side of the light fixture). Further, even if said press fit attachment is used in the mentioned arrangements, the attachment cannot apply in connection with a light-permeable protection in question. The reason is obvious: in the case a lamp in such a light fixture explodes, a sudden increase in pressure inside the cover and the light fixture ejects the cover out of the lighting fixture and so the cover with the small pieces of lamp glass fall down. Further, the structure of the light fixture cover is so weak that it cannot be utilized as a light-permeable protection, because it can simply break down because of lamp explosion.

[0009] In one embodiment of the above described light fixture cover system a very large number of ventilation holes is included in the light fixture body to provide heat transfer outside of the lamp enclosure. Moreover, these holes prevent water, insects and other contamination from entering the lamp enclosure. The holes are preferably formed by outward deformations.

[0010] There are some problems with the ventilation holes arranged to the light fixture body. The holes should be very small, otherwise water, insects and other contaminants cannot be kept outside the lamp enclosure. When the holes are tiny, they clog easily and ventilation effect decreases. Further the ventilation holes are perforated to the light fixture body, which is laborious process.

[0011] The invention relates to a light-permeable protection for a lighting fixture, which protection includes a light-permeable cupola part and a collar provided with fastening means for fastening the cupola part detachably to the lighting fixture, which collar is provided with at least one aperture, through which the ventilation in the interior of the protection is arranged to be carried out. According to the invention a dust filter is provided in connection with the aperture/apertures and the collar is provided with a pocket in which a plate-like, porous and elastic dust filter can be fitted.

[0012] It is an advantage of the invention that the protection is a separate accessory that can be installed in existing industrial lamps or the like. As an alternative, it can be purchased as an accessory for new lighting fixtures in industrial or exhibition facilities or in public facilities in general, either new facilities or facilities to be restored. This makes it possible to raise the safety level in said facilities, because the risk of scattering glass splinters produced by possibly explosive lamps is eliminated. This aspect is particularly important in the illumination of production facilities in the food industry. The spreading of tiny glass splinters in the foodstuffs treated in the production process is not desirable. It is, however, pointed out that a lighting fixture functions and can be used also

without a protection according to the invention.

[0013] The advantage of the invention is that the ventilation in the interior of the protection and the reflector is arranged to be carried out through the aperture. When the lighting fixture is in operation, the air inside the protection and the reflector is heated and expanded, and through the aperture, the expanding air can be discharged out of the lighting fixture. When the lighting fixture is switched off, the situation is reversed, and air flows through the aperture into the interior of the lighting fixture. In that case, the reflector of the lighting fixture can be a closed reflector, realized without any apertures.

[0014] In a preferred embodiment of the invention, the aperture is provided with a dust filter. The advantage is that dust cannot penetrate into the interior of the lighting fixture along with ventilation.

[0015] In another preferred embodiment of the invention, the cupola part is a revolution body with a curved surface, preferably an essentially hemispherical body. The advantage of this kind of shape is that it endures, without being broken and/or detached, the next impact-like pressure wave following the breaking of the lamp.

[0016] In another preferred embodiment of the invention, the cupola part is made of plastic, such as acryl, polycarbonate or the like. The advantage is that, as is well known, a plastic material endures impacts and pressure changes better than for example glass, and what is more, it is much lighter in weight.

[0017] The invention also relates to a light source unit comprising a light-permeable protection of claim 1 or 2 and a lighting fixture, particularly a ceiling lamp or floodlight made for high spaces, said lighting fixture comprising a reflector having a light aperture and, as fitted inside the reflector, a replaceable electric light source, such as a mercury lamp, which protection is detachably fastened with fastening means to the reflector of the lighting fixture, so that it encompasses the light aperture of the reflector.

[0018] The invention is explained in more detail below, with reference to the appended drawing, where

Figure 1 is a side-view illustration of a ceiling lamp that is provided with a protection according to the invention;

Figure 2 is a side-view illustration of a protection according to the invention, and

Figure 3 shows an enlarged view of a cut-off part A - A of the protection illustrated in Figure 2.

[0019] Like numbers for like parts are used in the drawings.

[0020] In Figure 1, the lighting fixture 2 is an industrial lamp installed in the ceiling, which lamp is used for illuminating high spaces, for example with a height of 5 - 20 m, for instance industrial or corresponding facilities. The lighting fixture 2 comprises a reflector 3 and, as fitted therein, a replaceable electric light source 4, such as a

mercury lamp, a high-pressure sodium lamp as well as mechanical and electric connecting elements 5 for connecting the lamp in the lighting fixture and further to an electricity source, advantageously the mains. By a support element 6, the lighting fixture 2 can be attached to the ceiling, but it can also be attached to the wall or to a pillar by suitable suspension elements.

[0021] In the example of Figure 1, the shape of the reflector 3 of the lighting fixture 2 is a rotation paraboloid, but it can also have some other geometrical shape, such as a truncated cone or the like, the cross-section of which can be a circle, an ellipse, a square, a rectangle or a combination of these.

[0022] The protection 1 according to the invention is detachably attached in connection with the reflector 3, particularly in its light aperture 31, as is illustrated in Figures 1 and 3. The protection 1 is realized to be a separate accessory that includes a light-permeable cupola part 11 and a collar 12. Fastening means 13 are provided for fastening the cupola part 11 of the collar 12 in the lower part of the reflector 3, particularly in the light aperture 31 of the reflector, so that it encompasses the light aperture 31.

[0023] In the described preferred embodiment of the invention, the fastening means 13 are realized by means of screws 13a. Advantageously the screws 13a are arranged at regular angle intervals, for instance at intervals of 90 degrees, on the circumference of the collar 12, so that in the protection fastening step, they can be turned towards the collar 12 and the interior of the protection 1, for fastening the protection to the reflector, and respectively in the removal step, they can be turned outwards from the collar 12 and from the interior of the protection, for detaching the protection from the reflector in order to remove it.

[0024] The collar 12 of the protection 1 is annular in shape, and it is provided with a fastening edge 12a. The fastening edge 12a forms, in the open orifice of the collar 12, an expansion in which the outer edge 32 encompassing the orifice 31 of the reflector 3 can be fitted, so that it is supported against the interior of the expansion. In addition, the fastening edge 12a of the collar 12 is provided with a sealing 16, preferably a sealing strip. In the fastening step of the protection 1, the sealing 16 is compressed in between the outer edge 32 of the reflector 3 and the fastening edge 12a, so that it forms an air-tight lock between the interior and exterior that the reflector and the protection have in common. When suitably turned to be closed (cf. dotted lines in connection with the screw 13a in Figure), the screws 13a serving as the fastening means 13 hold the reflector 3, by its outer edge 32, inside the fastening edge 12a, and consequently the protection 1 and the reflector 3 of the lighting fixture 2 mutually attached.

[0025] As an alternative, the fastening means 13 can be realized by means of a hoop and a latch arrangement. In that case the hoop is connected to the top part of the collar 12. When the protection 1 is attached in connection

with the reflector 3, the hoop is tightened around the lower part of the reflector of the lighting fixture by means of one or several latches belonging to the latch arrangement. The hoop is loosened by opening the latches, and respectively the protection can be detached from the reflector 3.

[0026] According to the invention, the collar 12 of the protection 1 is provided with at least one aperture 14. Through said aperture 14, the ventilation of the interior of the reflector 3 and the protection 1 is arranged to be carried out. In addition, a dust filter 15 is provided in connection with the aperture/apertures 14. As shown in Figure 3, the collar 12 is provided with a pocket 17, in which pocket a plate-like, porous and elastic dust filter can be fitted and easily replaced.

[0027] In an embodiment of the invention according to the drawings, the cupola part 11 of the protection is a revolution body with a curved surface, preferably a body with an essentially hemispherical shape. Advantageously the cupola part 11 is made of plastic, such as acryl, polycarbonate or the like.

[0028] The invention also relates to a lighting fixture 2 that is provided with a protection 1 described above. In particular, said lighting fixture 2 is a ceiling lamp or a floodlight made for high spaces, which lamp comprises a reflector 3 and as fitted therein, a replaceable electric light source 4, such as a mercury lamp, and a light-permeable protection 1 that is attached in connection with the reflector. The protection 1 comprises a light-permeable cupola part 11 and a collar 12 provided with fastening means 13 for fastening the cupola part detachably in the reflector 3 of the lighting fixture, so that it encompasses the light aperture 31 of the reflector 3.

[0029] The protection 1 is preferably realized and fastened in the reflector 3 by methods and elements that are described in the specification and/or drawings above.

[0030] The invention is not restricted to the above described embodiment only, but many modifications are possible within the scope of the invention as defined in the claims.

Claims

1. A light-permeable protection for a lighting fixture (2), which protection (1) includes a light-permeable cupola part (11) and a collar (12) provided with fastening means (13) for fastening the cupola part detachably to the lighting fixture, which collar (12) is provided with at least one aperture (14), through which the ventilation in the interior of the protection is arranged to be carried out, **characterized in that** a dust filter (15) is provided in connection with the aperture/apertures (14) and the collar (12) is provided with a pocket (17) in which a plate-like, porous and elastic dust filter can be fitted.

2. A light permeable protection for a lighting fixture ac-

cording to claims 1, **characterized in that** the cupola part (11) is a revolution body with a curved surface, preferably a body having an essentially hemispherical shape and that the cupola part (11) is made of plastic, such as acryl, polycarbonate or the like.

3. A light source unit comprising a light-permeable protection of claim 1 or 2 and a lighting fixture (2), particularly a ceiling lamp or floodlight made for high spaces, said lighting fixture comprising a reflector (3) having a light aperture (31) and, as fitted inside the reflector, a replaceable electric light source (4), such as a mercury lamp, which protection (1) is detachably fastened with fastening means (13) to the reflector of the lighting fixture, so that it encompasses the light aperture (31) of the reflector (3).

Patentansprüche

1. Lichtdurchlässiger Schutz für eine Beleuchtungsbe-
festigung (2), wobei der Schutz (1) einen lichtdurch-
lässigen Kuppelteil (11) und eine Manschette (12)
umfasst, die mit einem Befestigungsmittel (13) zum
lösbaren Befestigen des Kuppelteils an der Beleuch-
tungsbefestigung versehen ist, wobei die Manschet-
te (12) mit wenigstens einer Öffnung (14) versehen
ist, durch welche die Belüftung im Inneren des Schut-
zes zur Ausführung angeordnet ist, **dadurch ge-
kennzeichnet, dass** ein Staubfilter (15) in Verbin-
dung mit der Öffnung/den Öffnungen (14) vorgese-
hen ist, und wobei die Manschette (12) mit einer Ta-
sche (17) versehen ist, in welche ein plattenähnli-
cher, poröser und elastischer Staubfilter eingepasst
werden kann.

2. Lichtdurchlässiger Schutz für eine Beleuchtungsbe-
festigung nach Anspruch 1, **dadurch gekennzeich-
net, dass** der Kuppelteil (11) ein Rotationskörper
mit einer gekrümmten Oberfläche ist, vorzugsweise
ein Körper von im Wesentlichen halbkugelförmiger
Gestalt, und dass der Kuppelteil (11) aus Kunststoff,
wie beispielsweise Acryl, Polycarbonat oder derglei-
chen, gefertigt ist.

3. Lichtquelleneinheit, umfassend einen lichtdurchläs-
sigen Schutz nach Anspruch 1 oder 2 und eine Be-
leuchtungsbefestigung (2), insbesondere eine für
hohe Räume gefertigte Deckenlampe oder ein Flut-
licht, wobei die Beleuchtungsbefestigung einen Re-
fektor (3) mit einer Lichtöffnung (31) und, in den Re-
fektor eingepasst, eine austauschbare elektrische
Lichtquelle (4), wie beispielsweise eine Quecksilber-
lampe umfasst, wobei der Schutz (1) durch ein Be-
festigungsmittel (13) lösbar an dem Reflektor der Be-
leuchtungsbefestigung befestigt ist, so dass er die
Lichtöffnung (31) des Reflektors (3) umgibt.

Revendications

1. Protection, perméable à la lumière, pour un luminaire (2), ladite protection (1) comprenant une partie en coupole (11) perméable à la lumière et une collerette (12) équipée de moyens de fixation (13), pour la fixation, détachable par rapport au luminaire, de la partie en coupole, ladite collerette (12) étant munie d'au moins une ouverture (14) par laquelle la ventilation dans l'intérieur de la protection est agencée pour être accomplie, **caractérisée en ce qu'un** filtre à poussière (15) est prévu en connexion avec l'ouverture/les ouvertures (14), et la collerette (12) est munie d'une poche (17) dans laquelle peut être monté un filtre à poussières poreux et élastique, analogue à une plaque.

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2. Protection, perméable à la lumière, pour un luminaire selon la revendication 1, **caractérisée en ce que** la partie en coupole (11) est un corps de révolution à surface incurvée, de préférence un corps ayant une forme essentiellement sphérique et **en ce que** la partie en coupole (11) est formée de plastique, tel qu'un acryl, un polycarbonate ou analogue.

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3. Protection, perméable à la lumière, pour un luminaire selon la revendication 1 ou 2, et un luminaire (2), en particulier un plafonnier ou un projecteur d'éclairage réalisé pour des espaces hauts, ledit luminaire comprenant un réflecteur (3) ayant une ouverture à lumière (31) et, tel que monté à l'intérieur du réflecteur, une source de lumière (4) électrique remplaçable, telle qu'une lampe au mercure, ladite protection (1) étant fixée de manière détachable, à l'aide de moyens de fixation (31), au réflecteur du luminaire, de manière qu'il englobe l'ouverture à lumière (31) du réflecteur (3).

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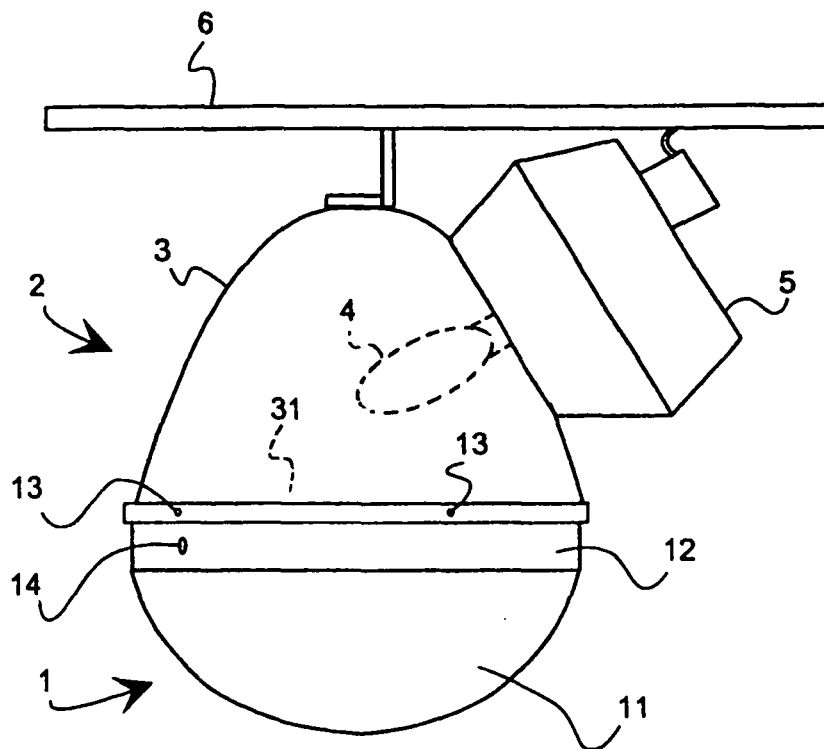


FIG. 1

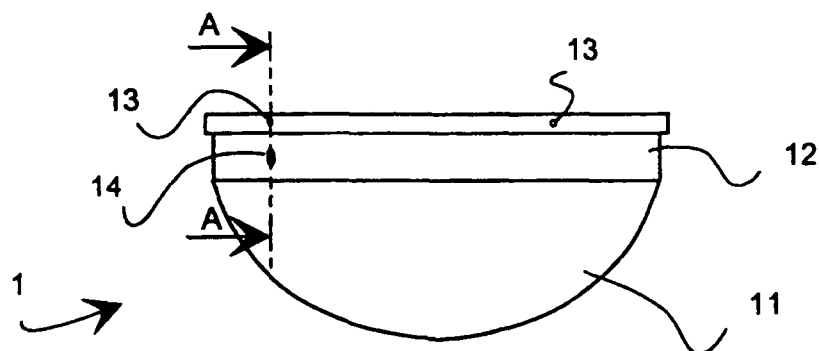


FIG. 2

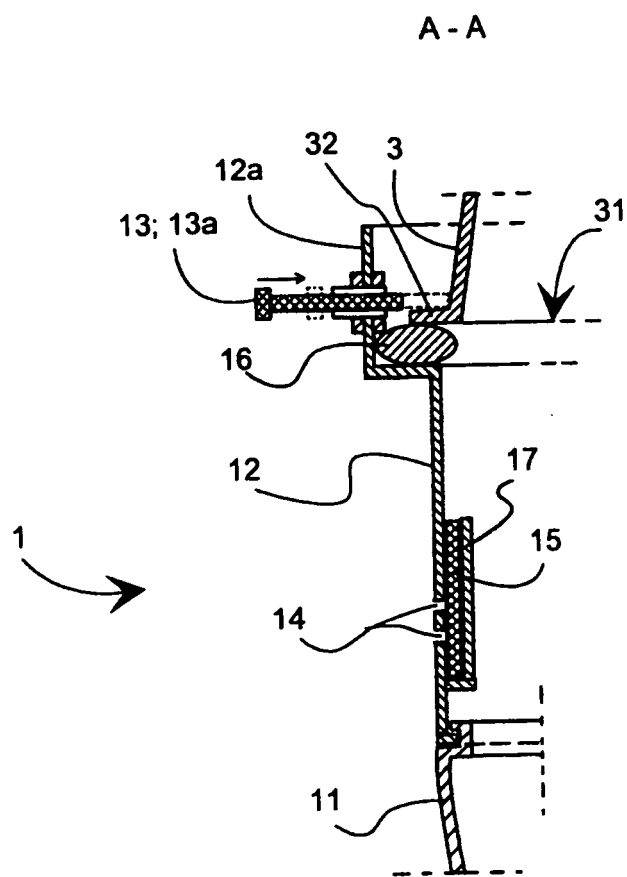


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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